Sandia & EMCORE
Solar Photovoltaics, Fiber Optics, MODE, and Energy Efficiency

R&D 100

Background

MODE (MicroOptical Devices) was an Albuquerque-based start-up company founded by a group of Sandians who left Sandia under a special entrepreneurial program. MODE was purchased in 1997 by EMCORE, a New Jersey company that has worked with Sandia since the early 1990s. MODE technology was based on Sandia-licensed compound semiconductors used in manufacturing vertical cavity surface-emitting laser components. Upon acquiring MODE, EMCORE became the first company to build a facility in the Sandia Science & Technology Park (SS&TP) in 1998 for their Photovoltaics Division, which builds solar cells for the space industry. This division is built on technology also licensed from Sandia. Since 1998, EMCORE has grown to occupy over 172,000 sq. ft. of space with its two current divisions, EMCORE Fiber Optics and EMCORE Solar Photovoltaics. In October 2006, EMCORE moved its corporate headquarters to Albuquerque, NM. Sandia and EMCORE are currently working together through an ongoing private sector/national lab partnership on several new program opportunities. EMCORE works with Sandia's photovoltaic division on testing, design validation, and certification of concentrator photovoltaic components and modules.

Innovative Edge

EMCORE is a leading provider of compound semiconductor-based components for the fiber optics and solar power markets. In March 2009, EMCORE Fiber Optics introduced a tunable XFP product line that is capable of replacing fixed-wavelength dense wavelength division multiplexing XFPs as well as high-performance tunable 300-pin multi-source agreed transponders. XFP refers to a form factor standard of 10 gigabit per second optical transceivers. The solar cell technology that EMCORE licensed from Sandia serves as the basis for their high-efficiency solar cells used in their concentrator photovoltaics (CPV) systems, which are used to generate solar power for terrestrial applications. In 2008, EMCORE was a recipient of an R&D 100 award for its world record Inverted Metamorphic (IMM) solar cell technology, which provides a platform for their next generation photovoltaic products. Solar cells built using the IMM technology have achieved record conversion efficiency of 33% used in space, and it is anticipated that the efficiency levels in the 42%-45% will be achieved when adapted for use in the terrestrial CPV systems.

Commercialization & Industry Impact

EMCORE's financial situation has improved substantially. The company is currently expanding business and hiring new employees. In June 2009, EMCORE signed an agreement with the Public Service Company of New Mexico (PNM) to become the first company to join PNM's Distributed Energy Solar Power Program. The 20-year agreement involves 114 kilowatts of solar power produced onsite at EMCORE's corporate headquarters in the SS&TP. The Sandia and EMCORE partnership has created hundreds of new, high paying jobs and has made an important contribution to the local technical community as well as the economy. Through technology transfer and commercialization, Sandia gained private sector funding for research, a stronger local research community, and products embodying Sandia technology, all of which support its national security mission.